

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A cathode assembly comprising:

a base;

a filament mounted to the base for delivering a stream  
5 of electrons;

a deflector carried by the base for deflecting the electrons or focusing the electrons into a beam;

an insulator for electrically insulating the deflector from the base, the insulator defining a bore;

10 a metal guide tube mounted in the insulator bore; and

a rod connected with the deflector adjacent a first end of the rod, the rod being received ~~within the insulator bore~~  
in and aligned by an inner bore of the guide tube.

2. (Original) The cathode assembly of claim 1, further including:

a second deflector supported by the base;

a second insulator for electrically insulating the  
5 second deflector from the base, the second insulator defining a second bore; and

a second rod, connected with the deflector adjacent a first end of the second rod, the second rod being received within the second insulator bore.

3. (Original) The cathode assembly of claim 1, further including:

another insulator for electrically insulating the deflector from the base, the other insulator defining  
5 another bore; and

another rod, connected with the deflector adjacent a first end of the rod, the other rod being received within the other insulator bore.

4. (Currently Amended) The cathode assembly of claim [[1]] 6, further including a tube, mounted in the bore, which receives the rod.

5. (Original) The cathode assembly of claim 1, wherein the base defines a passageway, a first end of the insulator being received in the passageway.

6. (Currently Amended) ~~The A~~ cathode assembly of ~~claim 5, wherein~~ comprising:

a base which defines a passageway, the passageway ~~includes~~ including a first portion and a second portion, the  
5 second portion having a larger internal diameter than the first portion such that a shoulder is defined between the first and second portions;

a filament supported by the base for delivering electrons;

10 a deflector supported by the base for deflecting the electrons or focusing the electrons into a beam;

an insulator for electrically insulating the deflector from the base, the insulator defining a bore, a first end of

the insulator being received in the passageway of the base,  
15 the insulator having a second portion of larger diameter  
than the first portion of the passageway which is received  
in the second portion[[s]] of the passageway; and  
a rod connected with the deflector adjacent a first end  
of the rod, the rod being received within the insulator  
20 bore.

7. (Original) The cathode assembly of claim 1,  
wherein the deflector defines a socket which receives a  
second end of the insulator.

8. (Original) The cathode assembly of claim 7,  
wherein the deflector defines a hole which extends into the  
deflector from the socket, the hole receiving the first end  
of the rod.

9. (Original) The cathode assembly of claim 8,  
wherein the deflector socket has a larger diameter than a  
diameter of the insulator, such that a gap is defined  
between the socket and a side wall of the deflector.

10. (Currently Amended) ~~The A~~ A cathode assembly ~~of~~  
~~claim 1, wherein comprising:~~

a base;

a filament mounted to the base for delivering a stream  
5 of electrons;

a deflector for deflecting the electrons or focusing  
the electrons into a beam, the deflector ~~defines~~ defining a  
well ~~which receives the;~~

an insulator for electrically insulating the deflector  
10 from the base, the insulator defining a bore; and  
a rod received with the well of the deflector adjacent  
a first end of the rod such that the insulator is connected  
with the deflector by the rod and does not itself contact  
the deflector, the rod being received within the insulator  
15 bore.

11. (Currently Amended) ~~The A~~ cathode assembly of  
~~claim 1, wherein~~ comprising:

a metal base;  
a filament supported by the base for delivering  
5 electrons;  
a deflector carried by the base for deflecting the  
electrons or focusing the electrons into a beam;  
an insulator for electrically insulating the deflector  
from the base, the insulator defining a bore, and the  
10 insulator ~~has~~ having a metallized coating on a first portion  
thereof, the insulator being brazed or welded to the base at  
the metallized coating; and  
a rod connected with the deflector adjacent a first end  
of the rod, the rod being received within the insulator  
15 bore.

12. (Original) The cathode assembly of claim 1,  
wherein the rod electrically connects the deflector with a  
source of electrical potential for biasing the deflector.

13. (Currently Amended) ~~The A~~ cathode assembly of  
~~claim 1, wherein~~ comprising:

a base;

a filament supported by the base which emits electrons  
5 and vaporized filament material;

a deflector supported by the base for deflecting the  
electrons or focusing the electrons into a beam, the  
deflector is being configured and positioned relative to the  
filament by a rod and an insulator to eliminate a direct  
10 line of sight for the flow of vaporized filament material  
between the filament and the insulator, the insulator  
electrically insulating the deflector from the base.

14. (Original) The cathode assembly of claim 6,  
wherein the second portion of the passageway is adjacent an  
upper end of the base.

15. (Original) The cathode assembly of claim 2,  
wherein the first ends of the first and second rods are  
connected by a connecting member and wherein the connecting  
member is connected with the deflector.

16. (Currently Amended) An x-ray tube comprising:  
an envelope which encloses an evacuated chamber;  
a cathode assembly disposed within the chamber for  
providing a source of electrons, the cathode assembly  
5 including:

a base supported in the envelope,  
a filament mounted to the base for providing  
the electrons,

10 a deflector carried by the base for  
deflecting the electrons or focusing the electrons  
into a beam,

an insulator for electrically insulating the  
deflector from the base, the insulator defining an  
internal bore, and

15 a rod connected with the deflector adjacent  
a first end of the rod, ~~the rod being received~~  
~~within the insulator bore and~~

an alignment tube which defines a bore  
mounted in the insulator bore, the tube receiving  
20 and aligning the rod; and

an anode disposed within the chamber positioned to be  
struck by the electrons and generate x-rays.

17. (Currently Amended) A method of assembling a  
cathode assembly comprising:

- a) attaching at least one rod to at least one  
deflector;
- 5 b) attaching a metal tube in an insulator to define  
a bore for receiving the rod;
- c) attaching the insulator to a base;
- d) attaching a filament assembly to the base;
- e) sliding the rod into the tube to ~~mount~~ position  
10 the deflector to adjustably select a distance from  
~~to~~ the base; and
- f) attaching the rod to the tube mounting the  
deflector the selected distance from the base.

18. (Original) The method of claim 17, wherein the step of mounting the rod to the deflector includes positioning the first end of the rod in a hole within the deflector and brazing the rod to the deflector.

19. (Currently Amended) ~~The A~~ method of ~~claim 17,~~  
~~wherein the step of assembling a cathode assembly~~  
~~comprising:~~

a) attaching at least one rod to at least one  
5 deflector;

b) ~~attaching the an~~ insulator tube to ~~the a~~ base  
~~includes including:~~

metalizing one end of an outer surface of the  
insulator tube;

10 positioning the metalized end of the  
insulator in a bore in the base; and

brazing the metalized surface of the  
insulator to the base;

c) sliding the rod into a bore in the insulator tube  
15 to mount the deflector to the base while insulating the rod  
from the base; and

d) attaching the rod to the insulator tube.

20. (Original) The method of claim 17, wherein the step of attaching the tube in the insulator includes:  
inserting the tube in a bore in the insulator;  
welding the tube to the insulator.

21. (Original) The method of claim 20, wherein the step of attaching the rod to the tube includes:

crimping the rod and the tube together.

22. (Original) The method of claim 17, further including:

as the rod is slid into the tube, setting and aligning the deflector;

5 performing the step of attaching the rod to the tube after the deflector has been set in a preselected position with a preselected alignment.

23. (Currently Amended) ~~The A method of claim 17,~~  
~~wherein: the step of assembling a cathode assembly~~  
~~comprising:~~

a) attaching at least one rod to at least one  
5 deflector;

b) attaching a metal tube in an insulator to define  
a bore for receiving the rod;

c) ~~attaching the insulator to the base includes~~  
inserting the insulator into a bore of a base from a first  
10 surface of the base;

d) ~~the step of attaching the filament assembly to the~~  
~~base includes~~ inserting a filament insulator into a second  
bore of the base from the first surface of the base; and

e) brazing the insulator and filament insulator to the  
15 base in a single brazing step;

f) sliding the rod into the tube to mount the  
deflector to the base; and

g) attaching the rod to the tube.